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Maercker, Andreas ; Einsle, Franziska ; Kollner, Volker

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DOI: <https://doi.org/10.1159/000099290>

Posted at the Zurich Open Repository and Archive, University of Zurich

ZORA URL: <https://doi.org/10.5167/uzh-66070>

Journal Article

Published Version

Originally published at:

Maercker, Andreas; Einsle, Franziska; Kollner, Volker (2007). Adjustment disorders as stress response syndromes: a new diagnostic concept and its exploration in a medical sample. *Psychopathology*, 40(3):135-146.

DOI: <https://doi.org/10.1159/000099290>

Adjustment Disorders as Stress Response Syndromes: A New Diagnostic Concept and Its Exploration in a Medical Sample

Andreas Maercker^a Franziska Einsle^b Volker Köllner^{c, d}

^aDepartment of Psychopathology, University of Zurich, Zurich, Switzerland;

^bClinic for Psychosomatics and Psychotherapy, University Hospital Carl Gustav Carus Dresden, Dresden,

^cClinic for Psychosomatic Medicine, Bliestal Hospital, and ^dInstitute of Psychoanalysis, Psychotherapy and Psychosomatic Medicine, University Hospital of the Saarland, Homburg/Saar, Germany

Key Words

Adjustment disorders · Posttraumatic stress disorder · Stress response syndrome

Conclusion: The new AD concept is theory driven and shows methodological soundness. Its application to further samples is recommended.

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Abstract

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Introduction

This paper is based on the assumption that the current definition of adjustment disorders (AD) is inadequate. A new definition is proposed and empirically tested. In the first section of the paper, the current definition of AD is described and its empirical status outlined. A new diagnostic model of AD as a stress-related disorder is then presented, drawing on psychological theories of posttraumatic stress disorder (PTSD). In the second, empirical section, preliminary data from a sample of patients attending a cardiology outpatient clinic are presented.

The definitions of AD given in DSM-IV and ICD-10 describe adjustment disorders as maladaptive reactions to identifiable psychosocial stressors or changes in life circumstances. The symptoms, which by definition emerge within 3 months of the onset of the stressor, include a wide variety of impairments in social or occupational functioning, as well as maladaptive extremes of anxiety and depression, and impulse control problems. According to DSM-IV, a diagnosis of adjustment disorder should not be made if

the symptoms meet the criteria for another Axis I mental disorder, such as anxiety disorder or depressive disorder. Various subtypes of AD are specified: with depressed mood, with anxiety, with mixed anxiety and depressed mood, with disturbance of conduct, with mixed disturbance of emotions and conduct, and an unspecified subtype.

Although very little was published on the subject of AD for an extended period, the past few years have yielded literature reviews [1] as well as new data from multi-site psychiatric studies [2, 3], longitudinal studies [4] and validation studies [5, 6]. The most recent, representative samples (18–64 years of age) indicate an AD prevalence of 0.5%, with the prevalence among women (0.6%) being twice as high as among men (0.3%) [2]. As expected, prevalence rates were higher in psychiatric populations: an AD rate of 22.6% was found in a consultation-liaison sample [3], the most common types being depressed mood (11.6%), mixed anxiety and depressed mood (5.9%), mixed disturbance of emotions and conduct (2.8%) and anxiety (2.5%) (other types below 1.0%).

There is much empirical evidence to indicate that AD is a transient disorder with a tendency to spontaneous remission [4, 7, 8]. Nevertheless, studies have shown that AD can lead to a higher rate of psychiatric morbidity, e.g., higher suicide rates [9]. Therefore, the existence of a contemporary AD conception seems justified.

Criticism of the Existing Definition of AD and Proposal for a New Approach

Several authors have pointed out that the current definition of AD is rather loose, that the debate on its validity has been unsatisfactory, and that the concept in general has suffered academic neglect [1, 5, 10]. Most clinicians and researchers use the diagnosis of AD as an exclusion criterion for affective disorders or anxiety disorders. At the same time, AD are frequently used as a residual category for patients who do not meet the diagnostic criteria for other disorders. The most common points of criticism are the differentiation between AD and normal adaptation processes and the overlap with other psychological disorders.

The new conception of AD presented here works on the assumption that AD are characterised by the central symptoms of intrusion, avoidance and failure to adapt. This proposal originates from the work of Horowitz [11], who included AD in the group of stress response syndromes, along with PTSD, acute stress disorder (ASD) and complicated grief. PTSD and its underlying processes

Table 1. Proposed diagnostic criteria for adjustment disorders after Maercker [32]

A	Reactions to an identifiable stressor occurring within 1 month of the stressful event
B	Intrusive symptoms <ol style="list-style-type: none"> 1 Recurrent, distressing and involuntary recollections of the event 2 Repetitive thoughts or constant rumination about the event, occurring most days for at least 1 month 3 Stress if reminded
C	Avoidance <ol style="list-style-type: none"> 1 Avoidance of stimuli associated with the event 2 Efforts to avoid thoughts associated with the event, usually in vain 3 Efforts to avoid feelings associated with the distressing event 4 Efforts to avoid talking about the event 5 Withdrawal from others
D	Failure to adapt <ol style="list-style-type: none"> 1 Loss of interest in work, social life, care for others, leisure activities 2 Difficulty concentrating, trouble sleeping 3 Lack of self-confidence when engaging in familiar activities
Additional characteristics determining the subtype <ul style="list-style-type: none"> – with depressed mood: the predominant manifestation involves symptoms of depressed mood – with anxiety: the predominant manifestation involves symptoms of anxiety – with disorders of impulse control: the rights of others are violated, e.g., by aggressive behaviour 	

have been systematically investigated over the past two decades. Research on complicated grief has also made great progress over the last decade [12, 13, 14], and the validity of distinguishing it from depressive disorders has been confirmed [15].

As is the case for PTSD, ASD and complicated grief, we assume that AD is triggered by an identifiable stressor event. Moreover, we assume that AD is characterised by some of the symptoms that define PTSD and ASD, namely intrusion, avoidance and failure to adapt. Table 1 presents the new diagnostic criteria in DSM style.

Stressor Event

The psychosocial stressors that may precipitate AD include divorce, difficulties with child rearing, illness or disability, financial problems, conflicts with work colleagues, moving, retirement and cultural upheaval. In contrast to the PTSD criteria, which describe the trigger events as life

threatening and traumatic, beyond the range of usual human experience, the stressor events defined by the AD criteria are the same as the severe life events described in life event research [16].

Intrusions

These are involuntary, recurrent and distressing memories, which either occur spontaneously or are triggered by a cue from the environment. The intensity of intrusions ranges from isolated thoughts relating to the stressor event to being plagued by memories. The intrusions characteristic of AD can be regarded as similar to those observed in PTSD. The distressing thoughts relate to the event and its consequences, e.g., why it happened, how it could have been prevented and how justice can be restored.

Avoidance

Those affected almost automatically try to avoid thoughts and feelings associated with the stressor event and to ban it from their conscience. Additionally, they may try to avoid certain activities and situations likely to arouse recollections of the stressor. However, these efforts are often in vain, as various aspects of life keep reminding them of the event.

Failure to Adapt

These symptoms reflect the behavioural and personality changes that may result if the stressor event is not processed successfully. They include difficulty concentrating and coping with everyday life or work, intrapersonal changes such as reduced self-confidence and noticeable changes in the interpersonal domain. It is common for people with AD to give up activities that were important to them before the stressor event, e.g., sports, hobbies or socialising. According to Horowitz et al. [12], failure to adapt – along with intrusions and avoidance – is also the basis of the symptom group characterising complicated grief [13].

The subtypes of AD specified in DSM-IV and ICD-10 also play a role in our new concept. The main reaction types are depressed mood, anxiety, disturbance of conduct and mixed states. Until now, the definition of subtypes has been rather loose, as is the general AD conception.

AD as Stress Response Syndromes: Theoretical Approaches

A theoretical model of AD should explain why some people who have experienced a traumatic event develop psychiatric distress, which processes determine the sever-

ity of this distress, and why this state persists for a period of time. It makes sense for theoretical models of AD to approximate models of PTSD, the main difference being in the intensity of the respective stressors. Because the stressor event is not life threatening in AD, short-term biological changes as in PTSD (e.g., fight and flight reactions, extremely high levels of stress hormones) are probably not primarily relevant to AD. Therefore, the following sections focus on psychological models of PTSD, which describe changes in cognitive schemata as well as behavioural and personality characteristics [11, 17, 18, 19].

Horowitz [11] described consecutive phases in the course of stress response syndrome, starting with an initial phase of realisation that a stressful event has occurred, followed by a phase of suppression of the threatening news, a phase of alternating intrusion and suppression, and a processing (or working-through) phase, which results either in the threatening information being integrated into the person's cognitive schemata or in negative outcomes in the form of psychiatric disorders or changes in personality. According to the theory by Horowitz [11], intrusive symptoms occur because the stressful information is not yet integrated into the person's cognitive schemata, but still represented in the active memory. Empirical evidence for this proposed succession of phases and phenomena has yet to be presented [20]. However, Creamer et al. [20] have been able to show that intrusions and avoidance function as mediators between the stressor event and later psychopathological sequelae.

Other authors have used different models to explain intrusion and avoidance. The associative network account of emotional processing by Foa et al. [21] essentially addresses the assumption that uncontrollable or unpredictable events are stored with a higher valence in the working memory. They propose an associative network (fear network) of memory consisting of three elements: stimulus information about the threatening stressor(s), information about cognitive, behavioural and physiological reactions to the threatening stressor(s), and meaning elements representing basic assumptions (e.g., safety expectations) and their violation. The authors propose that in posttraumatic stress response, this associative network is pathological and acts as a persistent reminder, being activated whenever one or more of the elements in the network is encountered. In the case of AD, intrusive symptoms may be triggered when an element in the associative network is encountered, e.g., meeting one's former boss may trigger thoughts about the unexpected dismissal and why it happened. Foa et al. [21] argue that the aim of treatment

must be to modify the associative network so that it is no longer dysfunctional. Although evidence for this model has been provided by treatment-related data in particular [19], it has been criticised for being relatively fear related and 'traumacentric' [22]. That is, associative fear networks are essentially direct representations or memories of the stressful event. Cognitive appraisals or schemas of the world, the self and others are not a substantial part of the model, although they are mentioned as elements of the network. Despite these shortcomings, associative network theory provides a model of how the working memory is overactivated in stress response disorders [23].

Brewin et al. [17] expanded the memory model of PTSD in their dual representation theory. According to this theory, the first type of representation of the stressor event reflects the individual's direct memories of the event and forms what the authors call 'verbally accessible memories'. The second type of representation consists of situationally accessible memories that are accessed only when stimuli redolent of the original stressor situation cue their activation. Intrusions are considered to result from the activation of situationally accessible representations via cueing, whereas verbally accessible memories are the basis for discussion of the stressor in everyday life as well as in therapeutic contexts. In the models of both Foa et al. [21] and Brewin et al. [17], avoidance symptomatology is conceptualised as a range of techniques for dealing with involuntary recollections of the stressful event. Although Brewin's approach has its merits in clarifying different types of trauma-related memories and recollections, like network theory, the model focuses on the core stressor event rather than on appraisals of the self, the world and others, which seem to play a prominent role in AD.

Ehlers and Clark [18] proposed a model that goes beyond the representation of the stressor event in the memory and highlights a second aspect: individual differences in the appraisal of the stressor event and/or its sequelae. Appraisals are essentially cognitive interpretations of the world and the self. New information (e.g., 'I have been laid off at work') may produce a sense of severe acute threat to the self in some people (e.g., 'Will I find a new job soon or will I enter the ranks of the long-term unemployed? Will I have enough money to get by?'). Notably, in persons for whom the stressor event and its sequelae represent a serious threat to their view of themselves (e.g., as worthy or capable), the general organisation of the autobiographical memory may be disturbed. Such people seem unable to reorganise their previous and subsequent experiences to construct a stable view of themselves and their life circumstances. This produces a sense of disori-

entation and means that their retrieval from memory will be less filled by current context and more cue driven than the perceptions of those with a strong sense of the self in context.

Another important aspect of the model by Ehlers and Clark [18] concerns avoidance behaviours. These cognitive and behavioural (see below) changes have the potential to lessen the immediate sense of threat, but in the long term, they inhibit readjustment and hence protract the disorder. Avoidance symptoms include a range of behaviours that reflect the individuals' negative appraisals of the stressor experience and its sequelae. For example, people who are unexpectedly dismissed may avoid meeting former colleagues because they fear having to talk about their dismissal and the negative feelings that will ensue.

Additionally, the model proposed by Ehlers and Clark [18] describes a wide range of behavioural maladjustment symptoms, some of which are relevant to AD in terms of failure to adapt symptoms. These symptoms are again the outcomes of attempts to control a severe, immediate threat by applying a variety of strategies, usually in vain (dysfunctional symptoms). The strategy selected is meaningfully linked to the individuals' appraisals of the trauma and/or its sequelae and their general beliefs about how best to deal with the trauma, as illustrated in table 2. The behaviours intended to control the threat/symptoms are maladaptive in that they maintain the AD via one or both of the following mechanisms [18]: (1) directly producing AD symptoms of intrusion and avoidance or comorbid symptomatology (depression, anxiety) and (2) preventing change in negative appraisals of the event and/or its sequelae.

Further examples of dysfunctional strategies applied to reduce the distress triggered by the event are selective attention to cues associated with the event, constant rumination about the event and its consequences, and difficulty concentrating on other activities. Together, these dysfunctional behaviours can lead to changes in everyday life and, ultimately, to personality changes.

The psychological theories presented here, which were originally proposed as models of PTSD, thus form a basis upon which AD can be conceived as a stress response disorder, and the three symptom groups – intrusions, avoidance and failure to adapt – can be seen in a coherent context. Finally, it should be noted that – besides the compatible assumptions presented here – the four theoretical concepts [11, 17, 18, 21] differ in a number of ways, which have been discussed in detail in the literature [23, 24]. However, these differences are of more relevance to the

Table 2. Examples of appraisals and the associated dysfunctional behavioural strategies

Appraisal	Dysfunctional strategies/failure to adapt
If I see my friends ... they will ask me about the event and they will think that I am pathetic because I still haven't got over it	Break off contact with one's friends
If I do things that I used to enjoy ... I will be punished again ... I will be reminded of the event and will not be able to cope ... I will realise what a wreck I am and won't be able to bear it	Give up activities one used to enjoy
If I go to sleep ... I will have nightmares	Stay up very late
If I have more stress ... I will have a heart attack ... I will have a nervous breakdown	Avoid anything that could be stressful

Taken from Ehlers and Clark [18], table 2; adapted by substituting the word 'trauma' by 'event'.

therapeutic techniques applied than to the aspects discussed here. As mentioned above, the explanations of intrusions in the models of Foa et al. [21] and Brewin et al. [17] are particularly 'traumacentric', meaning that the traumatic event is the main focus of the model, rather than its sequelae, which are addressed in the model by Ehlers and Clark [18]. Differentiating between traumatic and AD-inducing events on the one hand and non-traumatic events on the other would go beyond the scope of this article and should be the focus of future theoretical and empirical studies.

Further Variables that Influence the Development of AD

Like other disorders, we can expect AD to be influenced by further factors: the nature and duration of the stressor event (e.g., single, repeated or long-term event), psychological processing during the stressor event, previous experiences and prior mental disorders [for a review, see ref. 22, 25]. Previous negative experiences may be associated with the stressor and exacerbate its effects. For example, a person who has been laid off from work might have a history of difficult relationships with his/her employers. In this case, he/she might interpret a sudden dismissal as a sign that he/she has again become a victim of bullying. Prior beliefs may also play a role. For example, individuals who are convinced that no one could ever harm them may find it hard to understand what is going

on when they are fired. Conversely, persons with prior negative beliefs about themselves may see the event as confirming these beliefs.

Prior psychiatric disorders can play an important role in determining which subtype of AD develops. For example, the probability of developing AD with depressed mood after a critical life event is greater for someone with a history of dysthymic disorder than for someone with no such history. However, it is by no means inevitable that a specific subtype (as defined by DSM-IV, see table 1) will develop given the presence of a corresponding set of symptoms. As far as we are aware, these remain open questions that have yet to be examined.

In general, the psychological model of AD is very receptive to the theoretical development of PTSD research, as far as both biological stress models [26] and social-interaction models [27] are concerned.

Empirical Evidence for the New Concept: A Study of Cardiology Patients

In a first analysis, we test the new AD model in a sample of patients attending a specialist cardiology clinic. All participants had an automatic implantable cardioverter defibrillator (AICD). The implantation of an AICD is a prime example of a stressful experience that can lead to an AD in some patients. Patients with an AICD implant may, for example, perceive themselves as still in danger ('I'm bound to collapse again soon'), be overwhelmed by

the situation ('I can't cope with the stress of this new situation'), or perceive the implant as an irreversible impairment ('I'll never be able to lead a normal life again').

It is well known that AICD patients suffer from psychiatric distress [28, 29, 30]. Craney et al. [28] examined adjustment problems in relation to coping styles and found that AICD patients with a less emotional coping style were able to function better on both the physical and emotional levels. In their review article, Sears et al. [30] came to the conclusion that patients with frequent electrical discharges and younger patients were at a higher risk for adjustment difficulties. Morris et al. [29] found that 33% of the patients with defibrillators in their – very small – sample could be diagnosed with AD.

The present sample of AICD patients is especially well suited to our empirical study of the AD model for several reasons. First, the implantation of an AICD is a severe life event. Second, the duration of the event is limited and the event itself is more uniform in nature than many of the common stressors that prompt stress disorders (e.g., divorce, family crisis, job loss, financial difficulties, retirement or cultural upheaval).

The first objective of our study was to determine the frequency of the individual symptoms and their suitability for diagnosing AD. Second, we aimed to test a simple diagnostic algorithm and its applicability to all AD subtypes. Third, we examined the level of correspondence between diagnoses based on the new concept and traditional diagnoses made on the basis of a structured clinical interview. Fourth, we applied the strict criteria of the current DSM version that AD can only be diagnosed without any further comorbid Axis I disorder, in order to arrive at the most conservative prevalence estimation.

Subjects and Methods

Participants

Participants were recruited by doctors at a specialist outpatient cardiology clinic for people with implanted defibrillators. All patients attending the clinic from June to December 2002 were asked to consent to a brief examination by a consultation-liaison psychologist immediately after seeing the cardiologist. Some 90% agreed to participate (as estimated by the cardiologists; the exact numbers of the total population are not available). The study sample consisted of 160 patients (90.6% males) with a mean age of 62.7 years (SD 10.6, range 17–81). Their marital, educational and employment status mirrors that of their age group in the general population [31]: 82.5% were married or cohabiting, two thirds (67.1%) had lowest or medium level of school education (Haupt- or Realschule) and 86.9% were retired (i.e. had reached

the retirement age or were unable to work due to disability or invalidity).

The participants were examined 2.3 years (SD 1.9, range 1 month to 9 years) after AICD implantation. They endorsed an average of 2.26 (SD 1.51, range 0–10) of the 14 stressful life events listed in the first part of the Adjustment Disorder New Module (ADNM) (see below). The event most commonly named was cardiac disease including AICD electrical discharge (70.0%), followed by other serious chronic illness (27.0%) and illness of a significant other (15.5%).

Measures

The ADNM measure consists of two parts: a life event list and a symptom list. The first part lists ten life events or problems described in DSM-IV as potential stressors: end of an important relationship, conflicts at work, job loss, retirement, serious time pressure, family conflict, financial difficulties, illness of a significant other, death of a significant other and moving. We added four items relating to heart failure and physical illness: serious heart disease, repeated shock waves, other debilitating disease and other serious chronic illness. Participants were asked whether they had experienced any of these events over the past year. The response format was 'yes' or 'no'. The link to the second part was the following instruction 'Please answer the following questions with regard to your most important problem'.

The second part of the ADNM lists 29 symptoms relevant to AD. Based on our concept of AD, first published in German [32], a list of 55 symptoms was drawn up, covering the areas of intrusions, avoidance, failure to adapt, anxiety, depression and disorders of impulse control. This pool of items was then presented to a group of 22 experienced clinicians in Dresden who were asked to rate the importance of each symptom for the specified AD symptom groups. All items scoring >2 on a 4-point scale were included in the final version.

Each item in the second part of the ADNM is allocated to one of three core symptom groups or three secondary symptom groups. The core symptom groups are intrusive symptoms (5 items, e.g., 'I keep having to think about the event'), avoidance symptoms (7 items, e.g., 'I try not to talk about the event') and failure to adapt symptoms (5 items, e.g., 'Other people have told me I've changed a lot since the event'). The secondary symptom groups are depressed mood (6 items, e.g., 'Since the event I've felt down and sad'), anxiety symptoms (3 items, e.g., 'Since the event I've been fearful in certain situations') and disorders of impulse control (3 items, e.g., 'I've noticed that I'm more agitated since the event'). Each item is rated on a 7-point Likert-type severity scale ranging from 0 (not at all) to 6 (very true).

The present version of the ADNM also allows the DSM-IV subtypes of AD to be specified: AD with depressed mood, with anxiety, with disturbance of conduct, with mixed anxiety and depressed mood, with mixed disturbance of emotions and conduct, and unspecified AD. A given subtype is present when there is a high score on the corresponding subscale of the ADNM, e.g., cases with high levels of ADNM/depressed mood are assigned to subtype AD with depressed mood, or cases with high levels of ADNM/depressed mood and anxiety are assigned to subtype AD with mixed anxiety and depressed mood. If only core symptoms and no secondary symptoms are present, the case is assigned to the unspecified subtype.

The Structured Clinical Interview for DSM-IV (SCID) Axis I disorders [33] were also administered, so that the new construct could be compared with the conventional diagnosis of AD. The AD module comprises seven items designed to diagnose AD. The main contents are as follows: (1) Did anything happen in your life shortly before your problems started? (2) What effect did the symptoms have on your life? How distressing were the symptoms? (3) Have you reacted in a similar way in the past? (Exclusion criterion for an Axis I disorder.) (4) Did a person close to you die shortly before the beginning of the present disorder? (Exclusion criterion for a grief reaction.) (5) How much time has passed since the stressor event and the symptoms it caused? (Exclusion criterion for stressors lasting more than 6 months.) (6) Clinical evaluation: presence of AD. (7) Determination of the subtype according to the symptoms (as described above). Furthermore, diagnoses of major depressive disorder, anxiety disorders and PTSD were assessed by the SCID in a subsample (see below).

Self-reports of distress were obtained using the Impact of Event Scale-Revised (IES-R) [34] and the Hospital Anxiety and Depression Scale (HADS) [35]. The IES-R is a widely used measure to assess the frequency of posttraumatic stress symptoms in the preceding 7 days consisting of subscales for intrusion, avoidance and hyperarousal. The German translation of the IES-R was validated by Maercker and Schützwohl [36]. The HADS is designed to detect the presence and severity of mild degrees of mood disorder, anxiety and depression and consists of an anxiety and a depression subscale. The validity of its German translation has been shown in various samples [37].

Procedure

The questionnaires were distributed in the cardiology outpatient clinic. The SCID interviews were administered by an interviewer who had been given some 20 h of special training. The results of further clinical assessments that go beyond the scope of the present paper are reported in Einsle et al. [38].

Results

Frequency of Psychometric Characteristics of the Symptoms/Items

We began by analyzing the psychometric item difficulty (= mean) and discriminatory power (= correlation with the other items in the respective symptom group) for each symptom. The results are presented in table 3.

Only the symptoms 'withdraws from friends and family' (avoidance symptoms) and 'suicidal thoughts' (depressed mood symptoms) showed an item difficulty of mean <1.5. These are also the items with the lowest discriminatory power (0.51 and 0.41, respectively). Because the withdrawal symptom correlated to the same level with depressed mood symptoms ($r = 0.51$, $p < 0.001$), we decided to omit this item from further analysis for reasons of content validity. The suicidal thoughts symptom, on the other hand, did not correlate to a high degree ($r < 0.25$ for

all) with another symptom group and was therefore included in the further analysis. In the last column of table 3, symptom endorsement on the Likert scale is converted to categorical data for use in epidemiological analysis to show the prevalence rates of the individual symptoms. In order to check if the three symptom groups are really clusters, correlations were compared within a symptom group and compared with correlations between symptom groups. It was expected that they were higher for within comparisons. This was the case for the majority of symptoms (15 out of 17) in the AD main symptom groups' intrusion, avoidance and failure to adapt. Some overlap existed between subtype-determining symptoms in specific depressed mood and failure to adapt, as well as in anxiety and avoidance symptoms.

In the next step, internal consistencies were determined for the symptom groups/ADNM subscales (using the Likert-scaled data). All consistencies were very satisfactory, with Cronbach's α of 0.85 for intrusion, 0.80 for avoidance, 0.79 for failure to adapt (0.81 when the withdrawal item is deleted), 0.80 for depressed mood, 0.83 for anxiety and 0.88 for disorders in impulse control.

To examine the convergent validity of the new ADNM subscales, correlation coefficients were calculated between these subscales and self-reports of conventional PTSD (IES-R) and depression (HADS) scales. As expected, we found moderate correlations between the IES-R or HADS and corresponding ADNM subscales (intrusions $r = 0.48$, avoidance $r = 0.38$, depressed mood $r = 0.54$, anxiety $r = 0.55$; all correlations were significant). For impulse control there was no corresponding scale available.

In line with the conventional classification procedure in DSM-IV, the following diagnostic algorithm was used: the majority or two thirds of the symptoms in a symptom group had to be present in each case for that symptom group to qualify as being 'present'. For the intrusions group, 3 out of 5 symptoms had to be present. When this rule is applied, 38.1% of the sample meet the criterion. For the avoidance group, 4 out of 6 symptoms are required (30.6%), for the failure to adapt group, 3 out of 5 (26.2%), for the depressed mood group, 4 out of 6 (13.1%), and for the anxiety group, 2 out of 3 (30.6%). The least common symptom criterion is disorders of impulse control, where 2 out of 3 symptoms are required (11.3%). The frequencies of the 6 symptom criteria differ significantly from one another ($\chi^2 = 17.5$, $p < 0.01$).

Prevalence of AD and Its Subtypes

In the next step, prevalence rates for AD of all subtypes were calculated (stressor criterion and symptom criteria of

Table 3. Item/symptom contents and psychometric test characteristics

Items	Symptom category	Item difficulty		Discriminatory power, $r_{\text{item subscale}}$	Symptom endorsement, %
		mean	SD		
Core symptoms					
Intrusions					
3	Repetitive thoughts	2.38	0.93	0.72	48.1
5	Stressed if reminded	2.26	1.04	0.78	44.4
12	Fear it could happen again	2.14	1.00	0.70	43.1
21	Non-controllable thoughts about event	2.03	0.97	0.78	31.9
23	Thoughts revolve around everything that ...	2.17	0.99	0.75	37.5
Avoidance					
4	Avoids talking about experience	2.10	0.93	0.55	31.3
9	Avoids particular reminders	2.17	1.06	0.68	43.8
13	Avoids thoughts of experience	2.12	1.03	0.67	35.6
15	Feels alienated from others	1.60	0.91	0.65	21.3
18	Tries to forget	2.51	1.20	0.68	53.1
22	Suppresses stressful emotions	2.14	1.08	0.75	42.5
29	Withdraws from friends and family	1.36	0.75	0.51	11.9
Failure to adapt					
2	Has received feedback on personality change	1.61	0.89	0.67	19.4
17	Difficulty concentrating	1.86	0.89	0.68	26.3
19	No longer confident to do certain things	2.39	1.14	0.69	49.4
25	Difficulty arranging everyday life or job	1.69	0.91	0.65	20.6
27	Trouble sleeping	2.08	1.13	0.66	37.5
Symptoms determining the subtype					
Depressed mood					
1	Feeling depressed and sad	2.15	1.02	0.71	40.6
6	Loss of interest in former activities	2.17	1.06	0.62	35.6
8	General loss of interest	1.61	0.85	0.58	17.5
11	Suicidal thoughts	1.09	0.40	0.41	3.8
26	Sense of a foreshortened future	1.80	0.94	0.74	23.1
28	No ambition to plan personal future	1.74	1.00	0.71	24.4
Anxiety					
7	Experiences anxiety if reminded	1.86	0.99	0.83	28.8
10	Has developed new anxieties	1.88	0.95	0.86	28.1
24	Fear of particular situations or actions	2.07	1.05	0.83	38.1
Disorders of impulse control					
14	Nervous and restless	1.99	1.04	0.80	10.0
16	More likely to lose one's temper	2.11	1.04	0.90	12.5
20	More frequently irritated with others	2.09	1.05	0.88	11.9

intrusion, avoidance and failure to adapt were positive). This was the case for 16.9% of the total sample. The prevalence rates for all AD subtypes are documented in table 4.

In line with the DSM terminology, we chose the label 'AD with disturbance of conduct/impulse control' when the symptom criterion 'disorder of impulse control' is met (see Discussion). It should be noted that anxiety and depressed mood symptoms are found in many of the subtypes (including combined subtypes), meaning that these

symptoms are no less frequent than the disturbance of conduct/impulse control symptoms.

Furthermore, simple control analyses were performed to test whether participants with AD (all subtypes) could be differentiated from those without AD in terms of selected variables. The two groups did not differ in terms of their age, gender or the time that had elapsed since AICD implantation. However, differences were noted in the number of additional stressors – on average 2.6 (SD 1.8)

Table 4. Prevalence of AD and its subtypes in the total sample (n = 160)

	n	Percentage of	
		total sample	AD patients
AD, all subtypes	27	16.9	
AD with depressed mood	1	0.6	3.7
AD with anxiety	4	2.5	14.8
AD with disorders of impulse control	9	5.6	33.0
AD with mixed emotional features	10	6.3	37.0
AD with mixed emotional features and disorders of impulse control	1	0.6	3.7
AD, unspecified subtype	2	1.3	7.4

Table 5. Comparison of ADNM and SCID diagnoses of AD in a subsample

SCID diagnosis of AD	ADNM diagnosis of AD		
	absent	present	total
Absent	34 (63.0)	8 (14.8)	42 (77.8)
Present	7 (13.0)	5 (9.3)	12 (22.2)
Total	41 (75.9)	13 (24.1)	54 (100.0)

Figures in parentheses are percentages.

for patients with AD and 1.1 (SD 1.0) for those without – $F(1, 159) = 32.15, p < 0.0001$.

SCID Diagnoses of AD and Comorbid Diagnoses

Data from a subgroup (n = 54) of the original sample, for which SCID diagnoses were available, were used to test the correspondence of the two diagnoses. The results of testing the AD diagnoses correspondence can only give a general orientation because, as described in the introduction, the SCID diagnosis is not derived from theoretical considerations and is only used as a criterion diagnosis here. As such, the results should not be viewed as a falsification test of the new AD concept, but as an indication of the extent to which the two measures agree. Table 5 shows a medium degree of correspondence, with an error rate of 27.8%.

If the SCID diagnosis is to be used as the standard by which other instruments are measured, the ADNM diagnosis of AD has a specificity of 0.81 and a sensitivity of 0.58. In the present case, the sensitivity is lower than the specificity. The higher specificity indicates that the ADNM is better suited to identify those who do not have AD ac-

cording to the SCID than to filter out those with an AD according to SCID. It is important to note that the lower sensitivity of the ADNM is not unexpected, given the more general formulation of the DSM and SCID AD.

Finally, comorbidity of ADNM cases with other relevant disorders was investigated. In the subgroup of 54 patients with SCID assessments, current major depression, anxiety disorders (agoraphobia, social phobia, specific phobias) and PTSD were diagnosed. From the 13 cases that were diagnosed with ADNM for AD, 8 (62%) had a comorbid disorder, 6 (46%) also had a major depression, 3 (23%) an anxiety disorder and 2 (15%) a PTSD. If one examines the remaining 5 ADNM cases without any comorbid disorder (9.3% of the subsample with SCID diagnoses), there remained 1 patient with AD with depressed mood, 3 patients with AD with mixed emotional features and 1 patient with AD with mixed emotional features and disorder of impulse control.

Discussion

In this article, we proposed a theoretical model of AD and presented first empirical evidence for this model. The theoretical model is based on the notion that AD is a stress response syndrome that can be operationalised in the same way as the core processes of PTSD – in terms of intrusions, avoidance and failure to adapt. In this discussion section, we interpret the empirical data before going on to discuss the theoretical model and its implications for treatment.

Empirical Investigation in an AICD Sample

Based on stress response theory, data on AD were collected from a sample of AICD patients attending a cardiology outpatient clinic. The implantation of a cardiovert-

er defibrillator was defined as the stressor event, to which some of the patients reacted with an AD. This result corroborates the findings of Morris et al. [29] and Sears et al. [30] who also observed adjustment difficulties and disorders after AICD implantation.

In the present study, all but one of the theoretically derived core symptoms of AD – intrusions, avoidance and failure to adapt – showed satisfactory item difficulty and discriminatory power. Only one of the avoidance symptoms (withdraws from friends and family) had unsatisfactory values. Future analyses should examine whether this symptom is relevant for other populations or, for example, characteristic only of the depressive subtype. The most commonly endorsed symptoms in the sample of AICD patients were intrusions, with symptom endorsement of 32–48%, followed by avoidance (excluding withdrawal) with symptom endorsement of 21–53%, and failure to adapt, with symptom endorsement between 19 and 49%. The symptom groups used to diagnose AD subtypes had the following frequencies: depressed mood 17–41% (apart from suicidal thoughts with 4%, though this was to be expected in the context of AD), anxiety 28–38% and disorders of impulse control 10–13%. Thus, the symptoms examined are psychometrically suitable for diagnostic applications.

The algorithm used to estimate the prevalence of symptom groups in line with DSM-IV allowed subgroups of AD to be diagnosed, the most frequent subgroup being AD with mixed anxiety and depressed mood (6.3%), followed by AD with disorders of impulse control (5.6%) and AD with anxiety (2.5%). Only 1.3% of the samples (7.4% of the patients with AD) were allocated to the unspecified subtype. It is worth noting that all AD subtypes with anxiety (simple or mixed) are particularly frequent (collectively, 9.4% of the total sample or 55.5% of all AD subtypes). We attribute this dominance of anxiety symptoms to the stresses specific to AICD implantation. The presence of a life-threatening cardiac disease along with the fear of unexpected electrical discharges seems to make anxiety one of the cardinal symptoms of this population [38, 39]. A different distribution of subtypes can be expected for other AD populations, e.g., those experiencing conflicts at work or marital discord.

The correspondence between the new AD concept and the conventional AD SCID diagnosis was examined. The convergence of the two diagnostic instruments was not particularly high, with sensitivity being less pronounced than specificity. As mentioned above, given the different operationalisations of the AD diagnoses, a high degree of agreement was not to be expected. Nevertheless, the spec-

ificity score shows that the AD diagnosis, as measured by the new instrument, does not create a large number of false-negative cases. In a recent study with cancer patients, a 1-item structured screening for AD and major depression was proposed and compared with DSM-IV diagnoses [40]. The sensitivity was 80% and specificity 61%. It should be emphasised that the validity of 1-item questionnaires can be easily jeopardised by invalid answers and that multi-item assessments are therefore favoured in psychometric research [41].

Finally, if the strict DSM-IV rules are adhered to that AD can only be diagnosed when no other current Axis I disorder is present, the AD cases are reduced to approximately 9% (by contrast, this was 17% of AD cases in our initial analysis). Further theoretical and empirical steps of investigation remain to be undertaken in order to establish whether according to the new model, AD should be diagnosed with or without Axis I comorbidities. Even a prevalence of 9% is in itself still a clinically relevant amount.

The present study has several limitations. The present stressor, namely cardioverter defibrillator implantation, was only able to serve as an 'experimental model' and only represents a small part of possible stressor events. Moreover, the studied sample was mainly composed of male patients. Furthermore, it would have gone beyond the scope of our study to include psychiatric diagnoses of the total sample other than AD in the analysis, but this should be done in future studies [42]. The prognostic value of the new AD diagnoses was not examined either [43]. Future studies should investigate general differences between patients with AD and those without AD in terms of distress, quality of life and well-being. Furthermore, the prognostic value over the course of the disorder should be evaluated; with a maximum duration of 3 months, stability, remission and the possible transition to another disorder are especially relevant to the prognosis of AD [4, 6, 8]. Future studies should examine the factor structure of the empirically derived symptom groups as well as the receiver operator characteristics of the symptoms and symptom groups. The first steps in this direction have already been taken [38].

A New Concept of AD as Stress Response Syndromes

Distress and disorder remain conflated in clinical practice and in the research community as we continue to medicalise the emotional vagaries of the human condition [43]. Although some will argue that the labelling of AD in existing classifications reinforces the medicalisation of distress, we believe that the value of this diagnosis lies in distinguishing those not requiring treatment from those

with similar symptoms and dysfunctions who would benefit from specific interventions.

Over the past 25 years, there have been fewer than 30 publications exclusively devoted to the diagnosis of AD in peer-reviewed journals [1]. This lack of interest is surprising given the prevalence of the disorder, and especially when contrasted with the vast concurrent interests in related topics such as PTSD and life-event research into the precipitation of a range of mental disorders [44, 45].

The diagnosis of AD requires careful evaluation of the relationship between the content and severity of symptoms, previous history and personality, and the stressor event/events. The latter relationship should be established clearly before the diagnosis can be made and there should be strong presumptive evidence that the disorder would not have arisen without it [46]. However, so far, our model does not resolve the potential problem whether a particular stressor event can lead to AD and PTSD or only to one of these conditions. Future theoretical modeling should explicitly address this question.

Until now, there has been no theoretically consistent model of AD. We have attempted to show that the adaptations of the new stress response theories that were originally developed for PTSD [11, 17, 21] can also be applied to the three core symptom groups of AD: intrusions, avoidance and failure to adapt. Intrusions are a ubiquitous phenomenon in the processing of stress and are central to a whole group of syndromes including PTSD, ASD and complicated or traumatic grief.

This new, theory-driven model of AD may be able to draw on advances in research on complicated or traumatic grief. In recent years, different formulations for diagnoses have been developed [12, 13, 14], a consensus conference has been held [47] and meta-analyses and reviews documenting the empirical advances have been published [48]. Many further studies will certainly be needed before AD can be elevated to the circle of reliable and valid modern psychiatric diagnoses.

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